CFS-B7SMK2

SERVICE MANUAL

E Model

Ver 1.0 1998. 11

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MF-B7S-148

SPECIFICATIONS

Frequency range
- FM : Saudi Arabia 87.6 – 107 MHz
  Other countries 87.6 – 108 MHz
- MW : 530 – 1,605 kHz
- SW1 : 2.3 – 7 MHz
- SW2 : 7 – 22 MHz

Aerials
- FM/SW : Telescopic aerial
- MW : Built-in ferrite bar

Recording system
- 2-track, 4-channel stereo

Frequency response
- 70 – 10,000 Hz

Speakers
- Full range : 10 cm (4 inches) dia, 2.8 ohms cone type × 2

Output
- Headphones jack (stereo minijack), for 16 – 68 ohms impedance headphones

Maximum Power output
- 2.5 W + 2.5 W

Battery life
- FM Recording : Sony R20P : Approx. 16 hours/Sony LR20 alkaline : Approx. 36 hours
- Playback : Sony R20P : Approx. 8 hours/Sony LR20 alkaline : Approx. 21 hours

Power requirements
- 110 – 120 V/220 – 240 V AC selectable, 50/60 Hz

Power consumption
- AC 14 W

Dimensions
- Approx. 500 × 155 × 164 mm (w/h/d) ($19^{3}/_{4} \times 6^{1}/_{8} \times 6^{1}/_{2}$ inches) incl. projecting parts and controls, not incl. handle

Mass
- Approx. 2.7 kg (5 lb 15 oz) not incl. batteries

Supplied accessory
- Mains lead (1)

Design and specifications are subject to change without notice.

RADIO CASSETTE-CORDER

MICROFILM

SONY®

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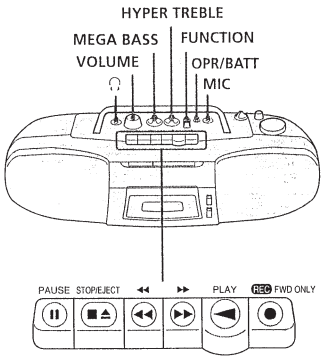
SAFETY-RELATED COMPONENT WARNING!!

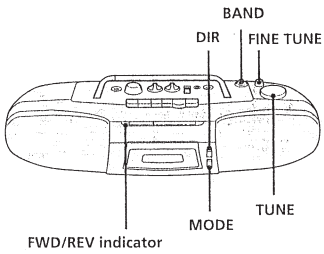
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
GENERAL

This section is extracted from instruction manual.

Location of controls

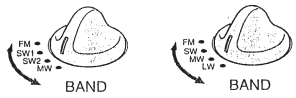




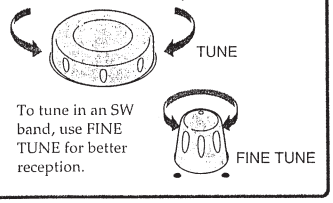
Listening to the radio

1 Set FUNCTION to RADIO.

2 Set BAND to the band you want.



3 Tune to the station you want.

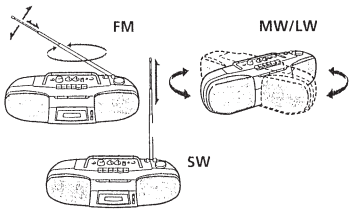


To turn off the radio

Set FUNCTION to TAPE (RADIO OFF) .

To improve broadcast reception

Reorient the aerial for FM. Reorient the player itself for MW/LW. For SW, pull the aerial vertically.



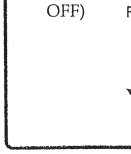
Tips

- To listen through headphones, connect the headphones to the ∩ (headphones) jack.
- For best results, place the player away from a TV.

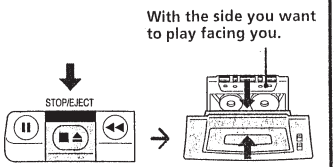
Playing a tape

Use TYPE I (normal) tape only.

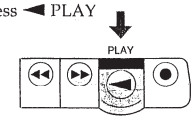
1 Set FUNCTION to TAPE (RADIO OFF)



2 Insert a recorded tape.



3 Press ◄ PLAY



To	Press
stop playback	■⏏ STOP/EJECT
fast-forward or rewind the tape	◄◄ or ►►
pause playback	❚❚ PAUSE Press this button again to resume playback.
switch playback to the opposite side	DIR

To adjust the bass and treble

Turn MEGA BASS toward MAX to enhance the low tones, and turn HYPER TREBLE toward MAX to enhance the treble tones.

Tips

- The FWD/REV indicator shows the side being played during playback: FWD◅ (the side facing you), or REV▻ (the reverse side).
- Set MODE to ⇄ to play either side, or ⇆ to play both sides repeatedly.

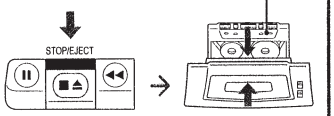
Use TYPE I (normal) tape only.

Recording

1 **To record from the radio**
Tune to the station you want.
To record from the built-in microphone (MIC)
Set FUNCTION to TAPE (RADIO OFF) .

2 Insert a blank tape.

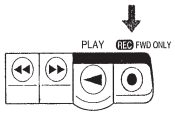
With the side you want to record on facing you.



3 Make sure the FWD◁ indicator is highlighted.
If the REV▷ indicator is highlighted instead, press the DIR lever to switch the highlight to FWD◁.

Note
The player cannot record from the reverse side of the tape (REV▷).

4 Press ● REC.
◄PLAY is depressed automatically.

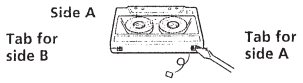


To	Press
stop recording	■≜ STOP/EJECT
pause recording	❚❚ PAUSE Press this button again to resume recording.

Tips
- For best results, use the AC power source (mains).
- Adjusting the volume or audio emphasis will not affect the recording level.

Notes
- When ● REC is pressed with MODE set to ⇄, the MODE setting switches to ⇄ automatically.
- When recording from the built-in microphone, the sound cannot be monitored through the headphones.
- If the MW or LW programme makes a whistling sound, set ISS (Interference Suppress Switch) (at the rear) to the position that most decreases the noise. Normally set the Switch to "2" (CFS-B7LMK2 only).

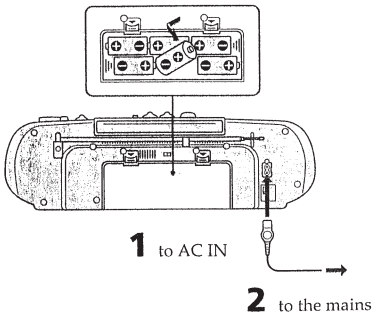
Notes on cassettes
- Break off the cassette tab from side A or B to prevent accidental recording. If you want to reuse the tape for recording, cover the tab hole with adhesive tape.



- The use of cassettes with more than 90 minutes of play time is not recommended except for long, continuous recording or playback.

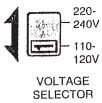
Choosing Power Sources

To use the player on AC power source (mains)
Connect the supplied mains lead to the AC IN jack.



To use the player on batteries
Insert six R20 (size D) batteries (not supplied) into the battery compartment.

To adjust the voltage (CFS-B7SMK2 only)
Be sure to set the VOLTAGE SELECTOR (at the rear) to your local power supply.



Tip
For customers supplied with an AC plug adaptor, use it if the plug of the mains lead does not match your mains.

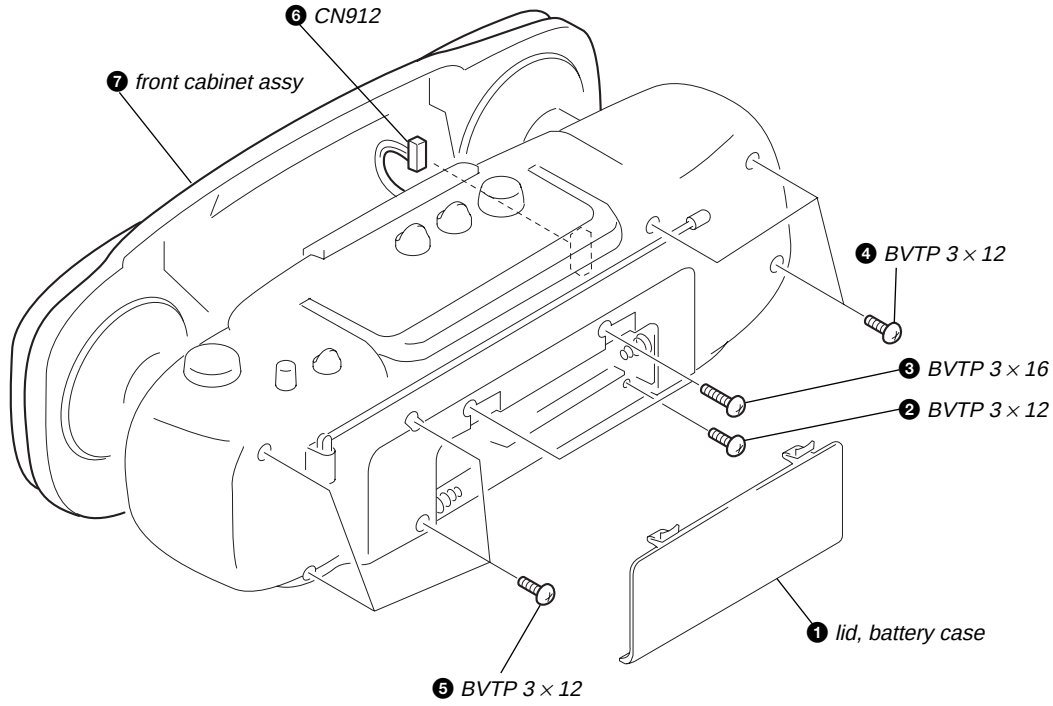
Notes
- To use the player on batteries, disconnect the mains lead from the player.
- Replace the batteries when the OPR/BATT indicator dims or when the player stops operating. Replace all the batteries with new ones.

SECTION 2
DISASSEMBLY

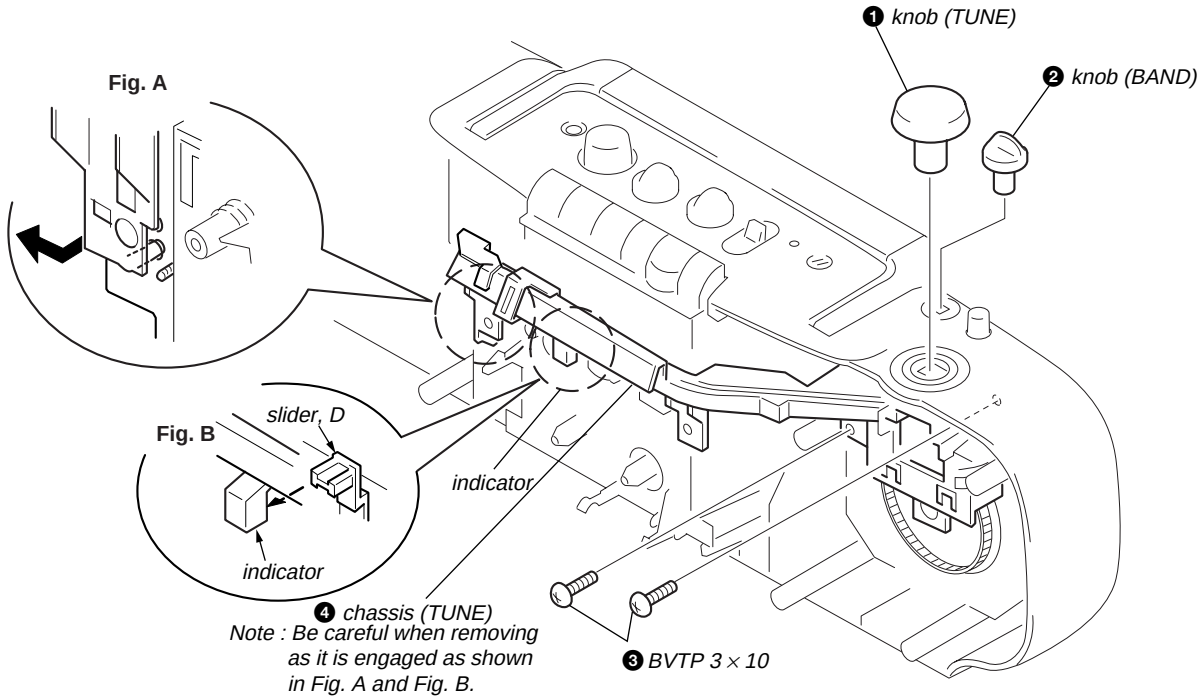
• The equipment can be removed using the following procedure.
Set ➡ Front cabinet assy ➡ Chassis (TUNE) ➡ Tape mechanism block ➡ Tuner, AC, Second board ➡ Audio, Mic board

Note : Follow the disassembly procedure in the numerical order given.

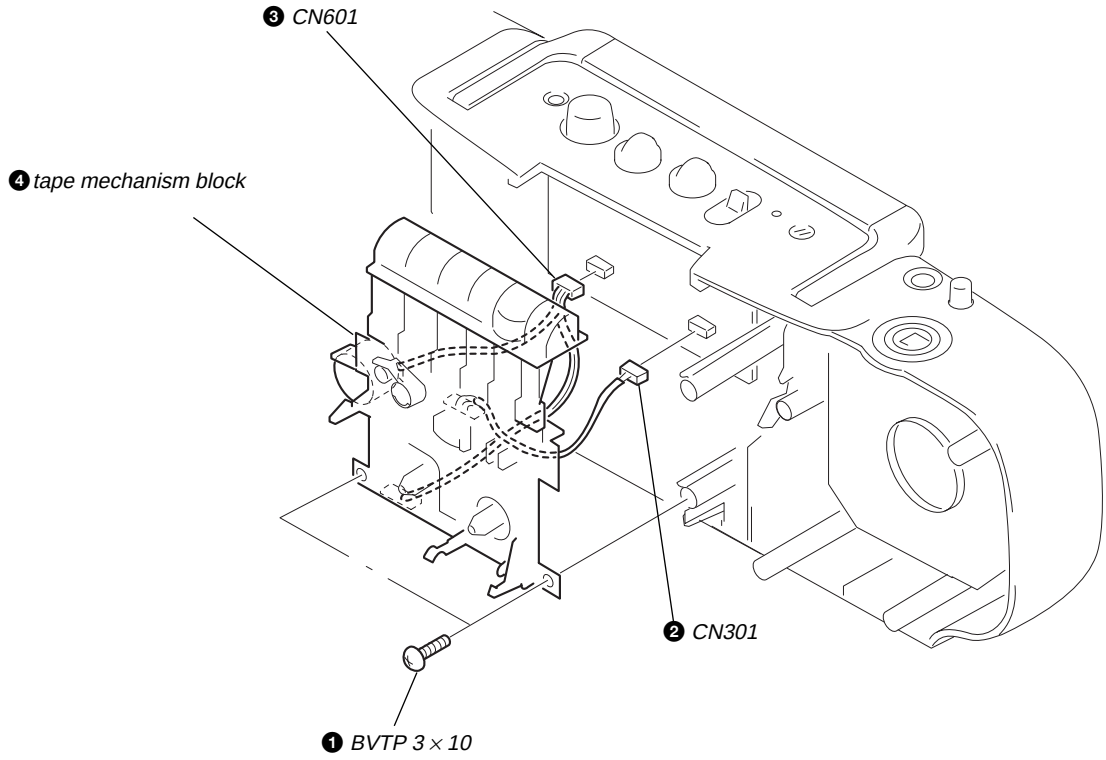
2-1. FRONT CABINET ASSY



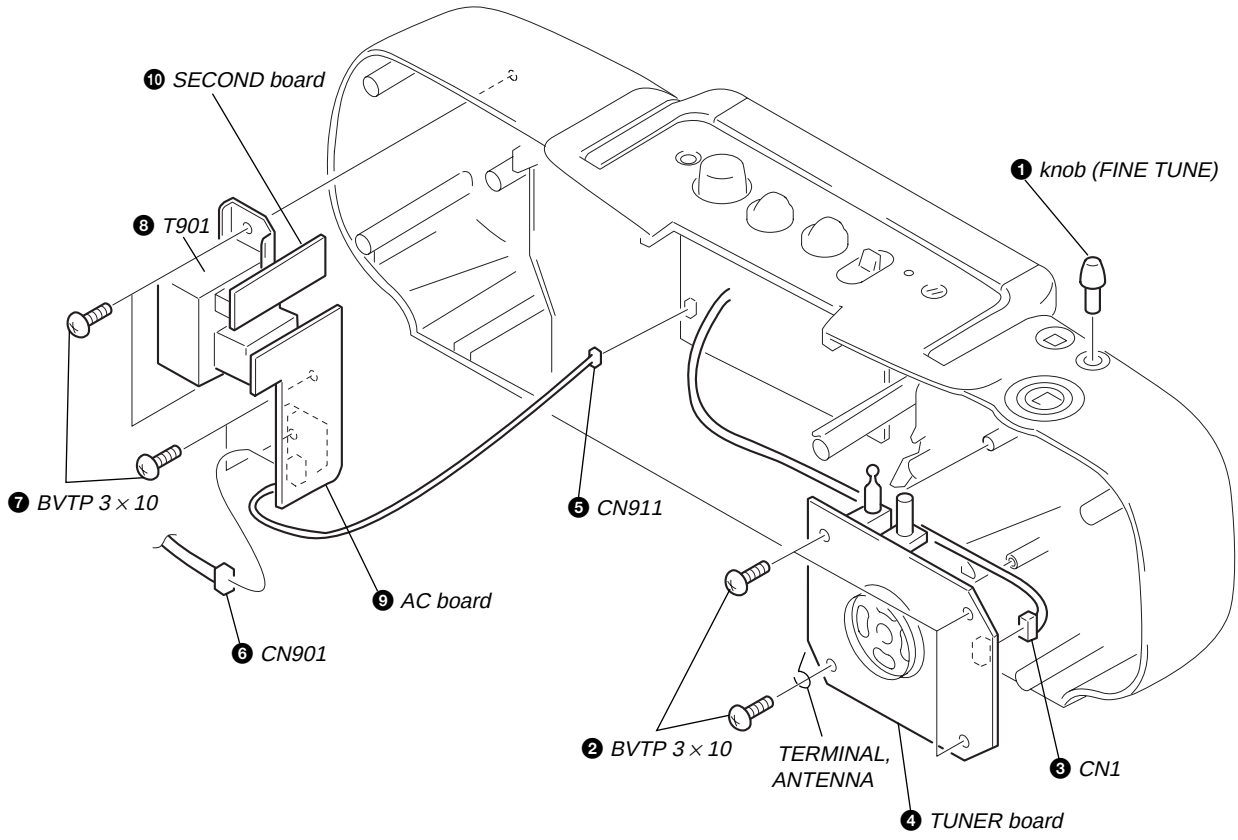
2-2. CHASSIS (TUNE)


❶ knob (TUNE)
❷ knob (BAND)
Fig. A
Fig. B
slider, D
indicator
indicator
❹ chassis (TUNE)
Note : Be careful when removing as it is engaged as shown in Fig. A and Fig. B.
❸ BVTP 3 × 10

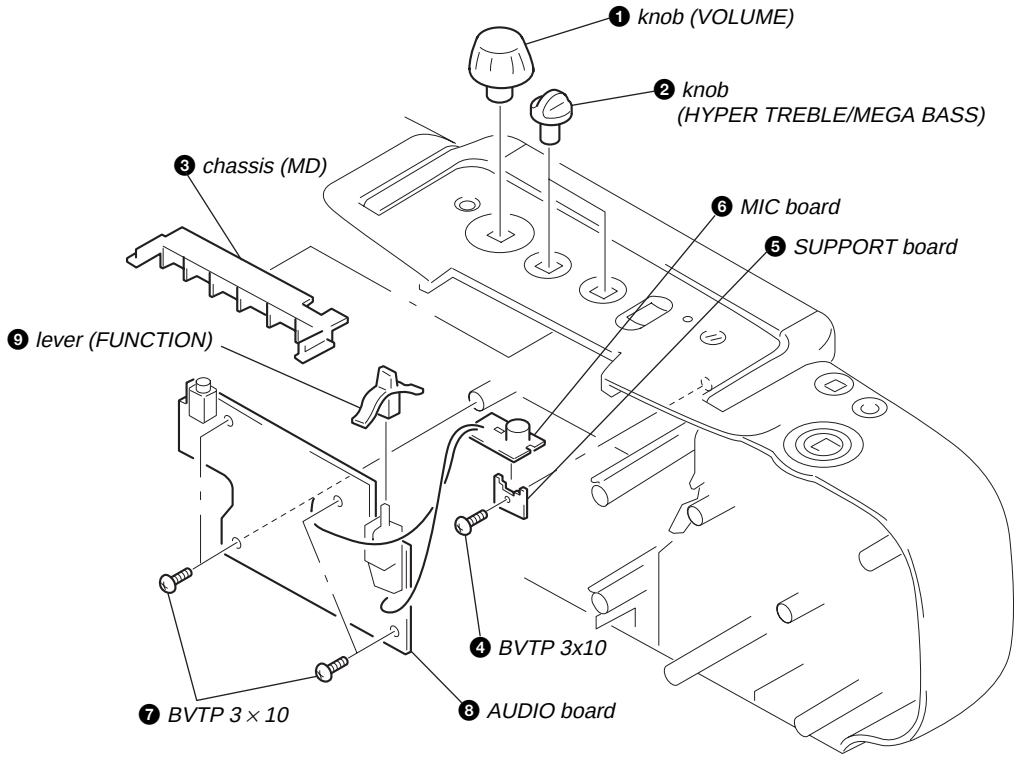
2-3. TAPE MECHANISM BLOCK



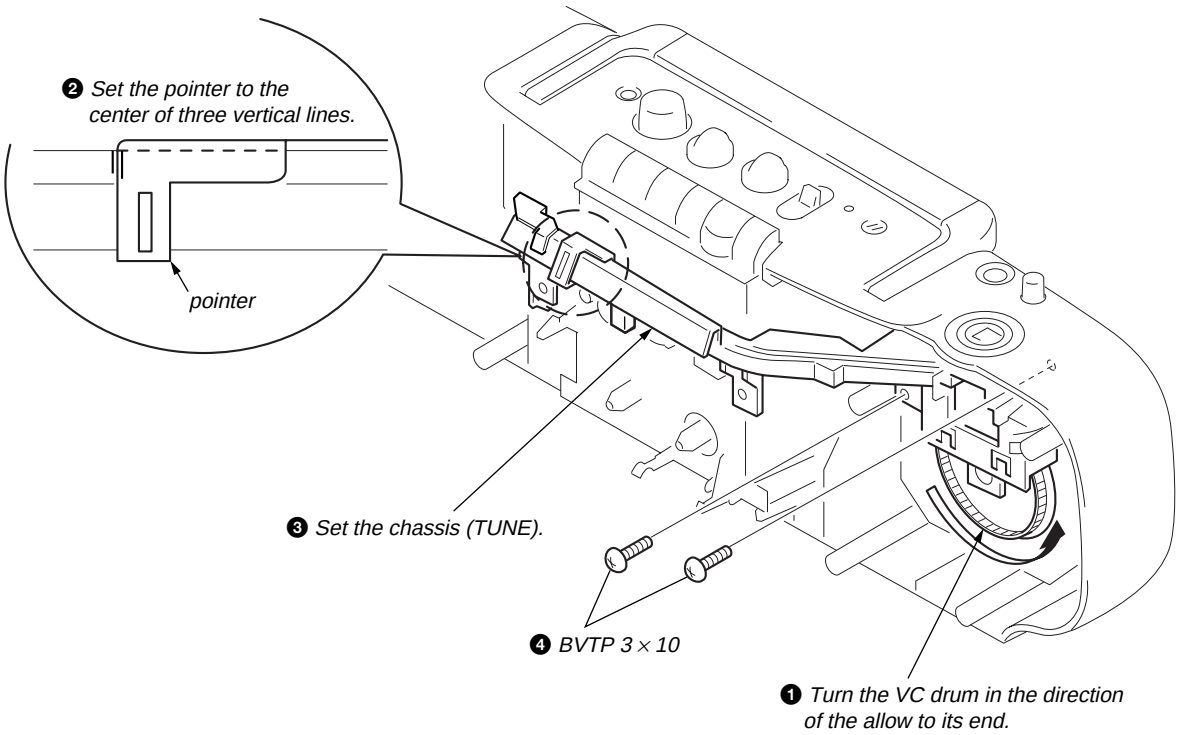
2-4. " TUNER BOARD ", " AC BOARD ", " SECOND BOARD "



2-5. “ AUDIO BOARD ”, “ MIC BOARD ”



2-6. DIAL POINTER SETTING


❷ Set the pointer to the
center of three vertical lines.
pointer
❸ Set the chassis (TUNE).
❹ BVTP 3 × 10
❶ Turn the VC drum in the direction
of the allow to its end.

SECTION 3
MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured alchool-moistened swab:
   record/playback head pinch roller
   erase head rubber belts
   capstan idlers
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be perfomed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Mode	Torque Meter	Meter Reading
Forward	CQ-102C	25 – 60 g•cm (0.35 – 0.83 oz•inch)
Forward back tension	CQ-102C	1 – 5 g•cm (0.014 – 0.069 oz•inch)
REV	CQ-102C	25 – 60 g•cm (0.35 – 0.83 oz•inch)
REV back Tension	CQ-102C	1 – 5 g•cm (0.014 – 0.069 oz•inch
Fast Forward	CQ-201B	55 – 140 g•cm (0.76 – 1.94 oz•inch)
Rewind	CQ-201B	55 – 140 g•cm (0.76 – 1.94 oz•inch)

Tape Tension Measurement

Mode	Torque Meter	Meter Reading
Forward	CQ-403A	more than 170 g (more than6.00 oz)

SECTION 4
ELECTRICAL ADJUSTMENTS

4-1. TAPE SECTION

0dB = 0.775V

Standard output level

Output terminal	HP OUT
Load impedance	32 Ω
Output signal level	0.25 V (–10 dB)

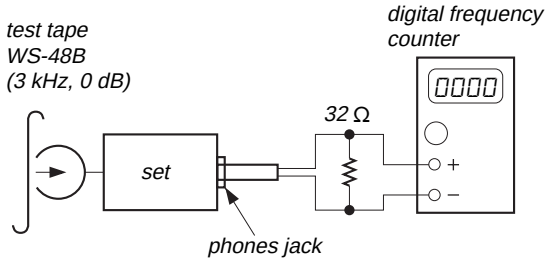
Test tape

Test Tape	Signal	Used for
WS-48B	3kHz, 0dB	tape speed adjustment
P-4-A063	6.3 kHz, -10 dB	head azimuth adjustment

Tape Speed Adjustment

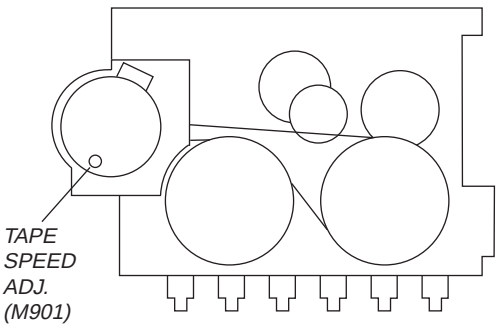
Procedure :

Mode : Playback



1. Playback the test tape in the FWD playback mode.
2. Confirm that the digital frequency counter reading indicates a value in the range of 2,940 to 3,060 Hz at tape top.
3. If the specification is not satisfied, adjust variable resistor of motor (M901) until the frequency counter reading is as close to 3,000 Hz as possible at the FWD tape top.
   Specification : 2,940 to 3,060 Hz
4. Frequency difference between the beginning and the end of the tape should be within 1.5% (45Hz).

Adjustment Location :



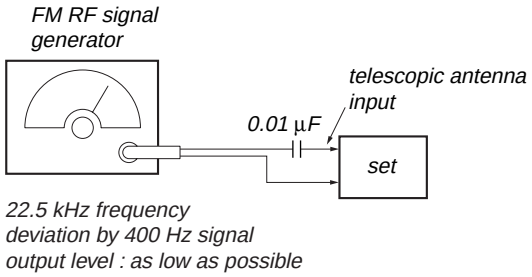
4-2. TUNER SECTION

0dB = 1µV

• FM Section

Setting :

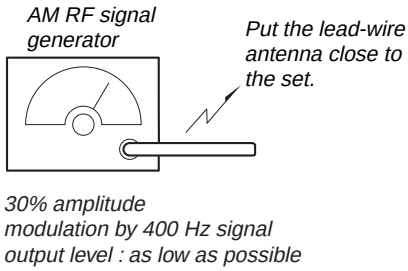
BAND switch : FM


FM RF signal generator
telescopic antenna input
0.01 µF
set
22.5 kHz frequency deviation by 400 Hz signal output level : as low as possible

• MW Section

Setting :

BAND switch : MW

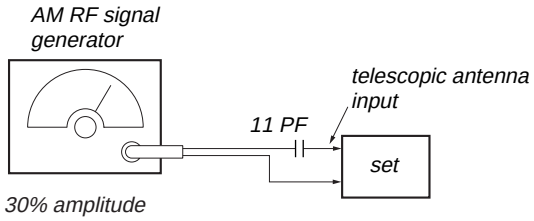

AM RF signal generator
Put the lead-wire antenna close to the set.
30% amplitude modulation by 400 Hz signal output level : as low as possible

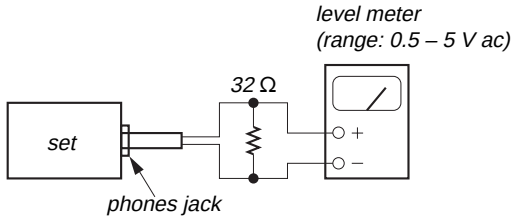
• SW Section

Setting :

BAND switch : SW1 or SW2

FINE TUNE control : mechanical mid


AM RF signal generator
telescopic antenna input
11 PF
set
30% amplitude modulation by 400 Hz signal output level : as low as possible



• Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

• Remove telescopic antenna in FM section adjustments.

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on Level meter.	
L2	CT2
86.5 MHz (87.35MHz)	109.5 MHz (107.8 MHz)

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on Level meter.	
L1	CT1
86.5 MHz (87.35MHz)	109.5 MHz (107.8 MHz)

FM IF ADJUSTMENT
T1
10.7 MHz

MW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on Level meter.	
L8	CT4
520 kHz (516 kHz)	1,680 kHz (1,640 kHz)

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on Level meter.	
L3	CT3
620 kHz	1,400 kHz

AM IF ADJUSTMENT
Adjust for a maximum reading on level meter
T2
455 kHz

SW1 FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on Level meter.	
L6	CT6
2.2 MHz	7.3 MHz

SW1 TRACKING ADJUSTMENT
Adjust for a maximum reading on Level meter.
L5
2.25 MHz

SW2 FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on Level meter.	
L4	CT8
6.8 MHz	22.5 MHz

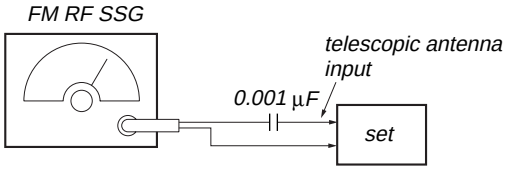
SW2 TRACKING ADJUSTMENT
Adjust for a maximum reading on Level meter.
L7
7 MHz

( ) : Saudi Arabia model

Adjustment Location : See page 10.

• **FM VCO Adjustment**

Setting:



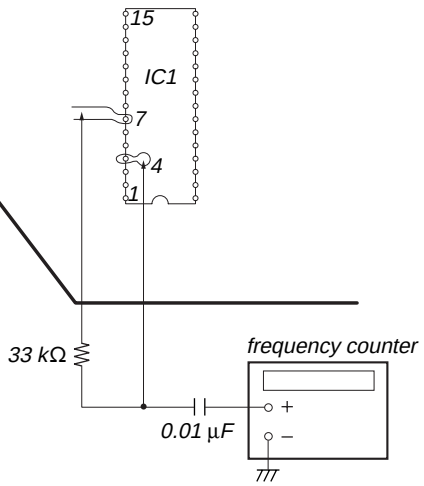
Carrier frequency : 98MHz
Modulation: no modulation
Output level: 0.1 V (100 dB)

Procedure:

1. Connect a frequency counter as shown below.
2. Tune the FM tuner to 98 MHz.
3. Adjust RV1 so that the frequency counter reading is 76 kHz.
   Specification : 75,950 Hz to 76,050 Hz

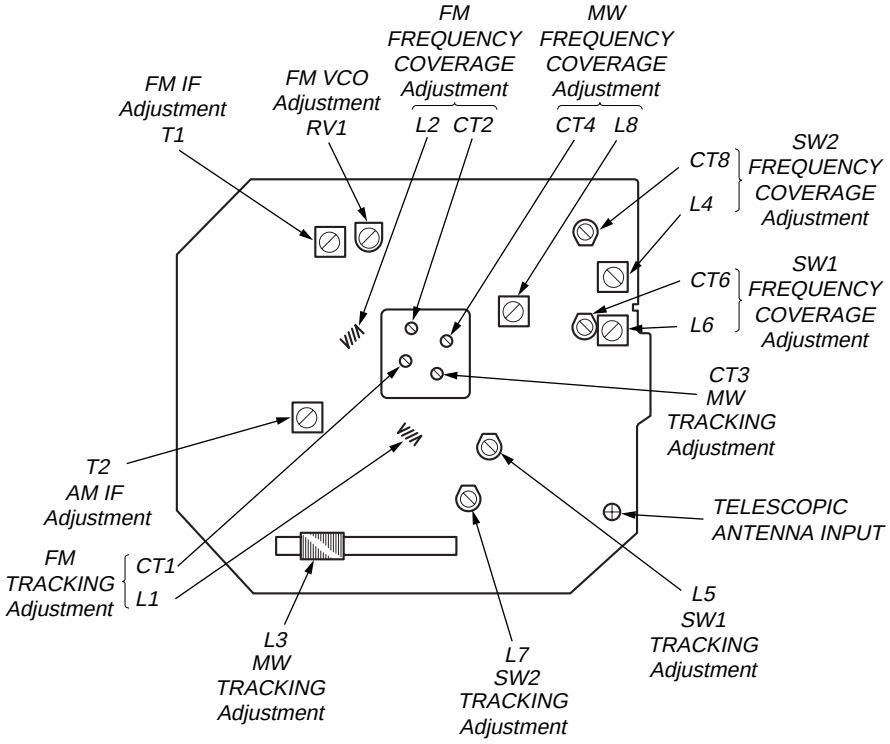
Adjustment Location:

–TUNER board (conductor side)–



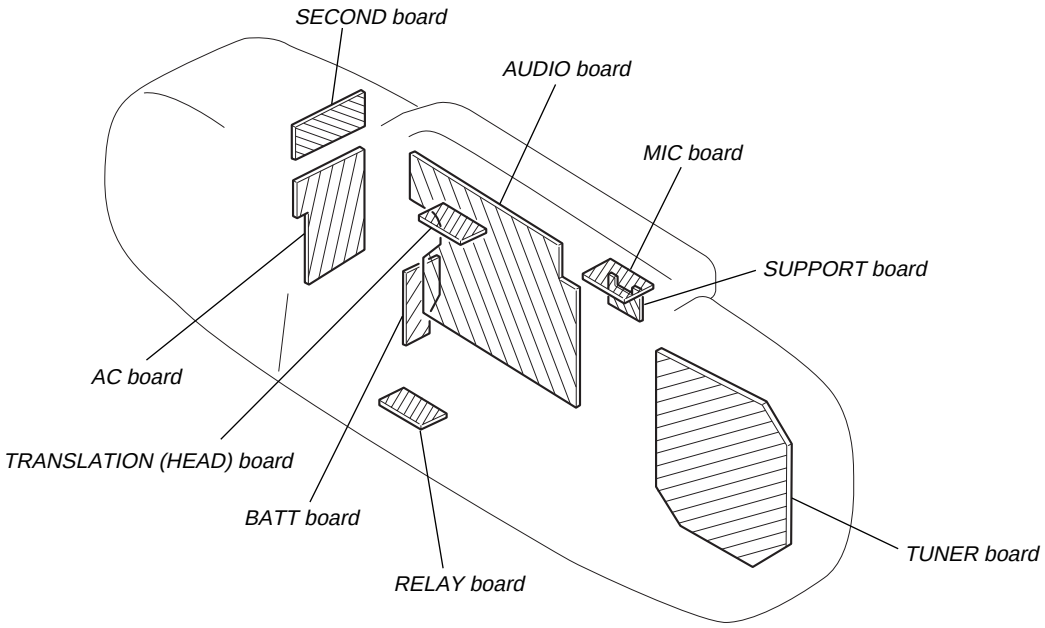
Adjustment Location:

–TUNER board (component side)–



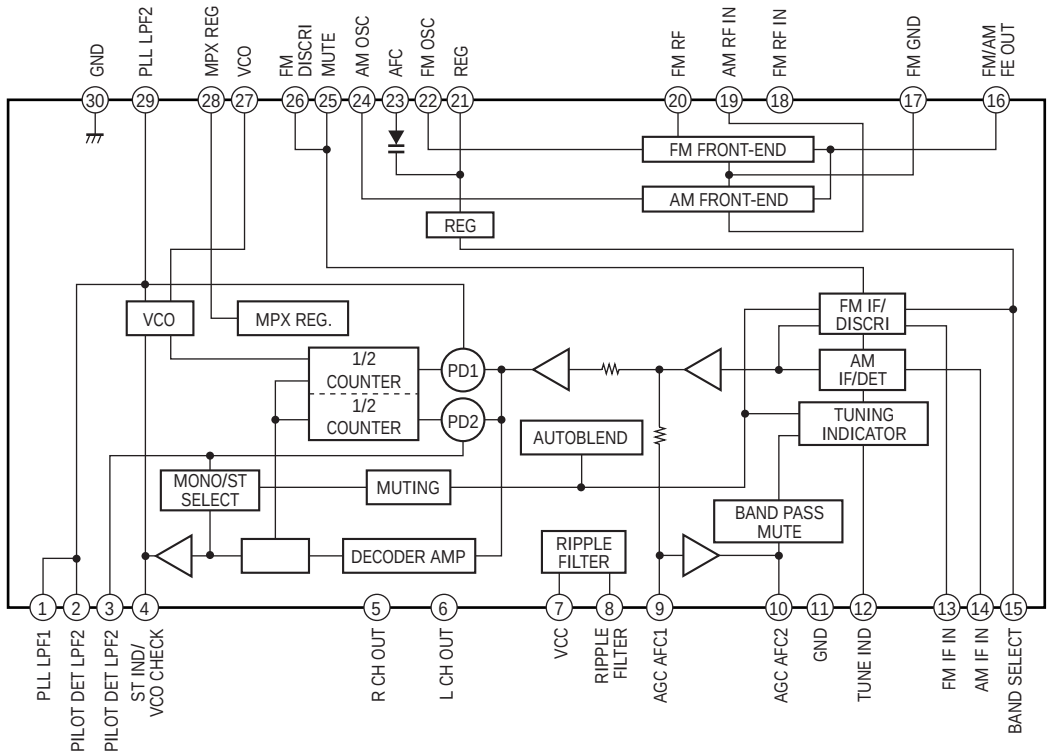
SECTION 5
DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION



• **IC Block Diagram**

IC1 CXA1238S



5-2. PRINTED WIRING BOARDS – TUNER SECTION –

• Refer to page 11 for Circuit Boards Location.

	1	2	3	4	5	6
A						
B						
C						
D						

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this necessary note is printed in each block)

For Schematic Diagrams.
Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- B + : B+ Line.
- ▬ : adjustment for repair.
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltages is dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
  ( ) : MW/SW
  (( )) : PB
  << >> : REC
- Voltages are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM
  ⇨ : PB
  ⇨ : REC
  ⇨ : SW1
  ⇨ : SW2
  ➡ : MW

• Semiconductor Location

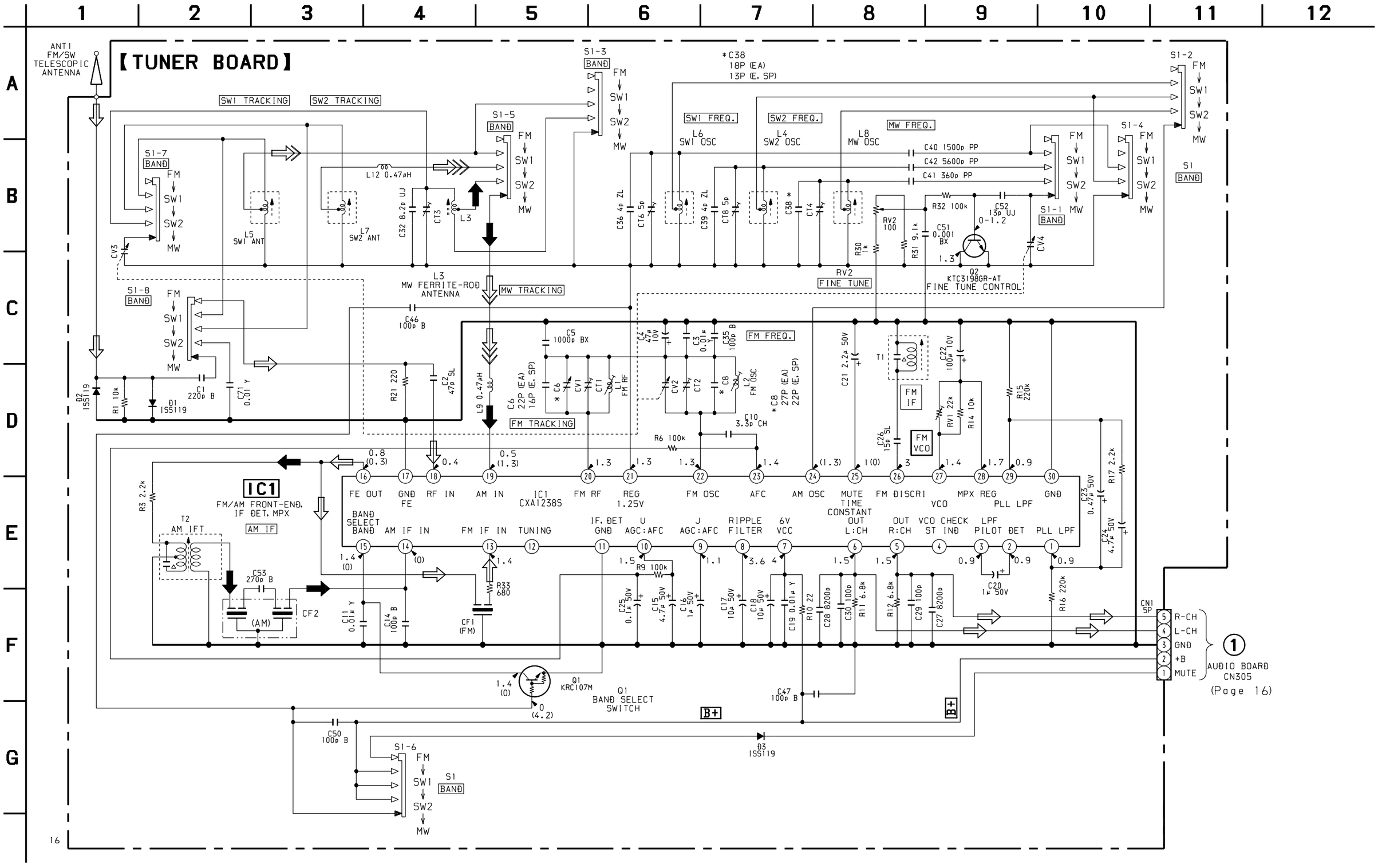
Ref. No.	Location
D1	B-5
D2	B-5
D3	B-2
IC1	C-3
Q1	B-2
Q2	D-4

Note on Printed Wiring Boards:

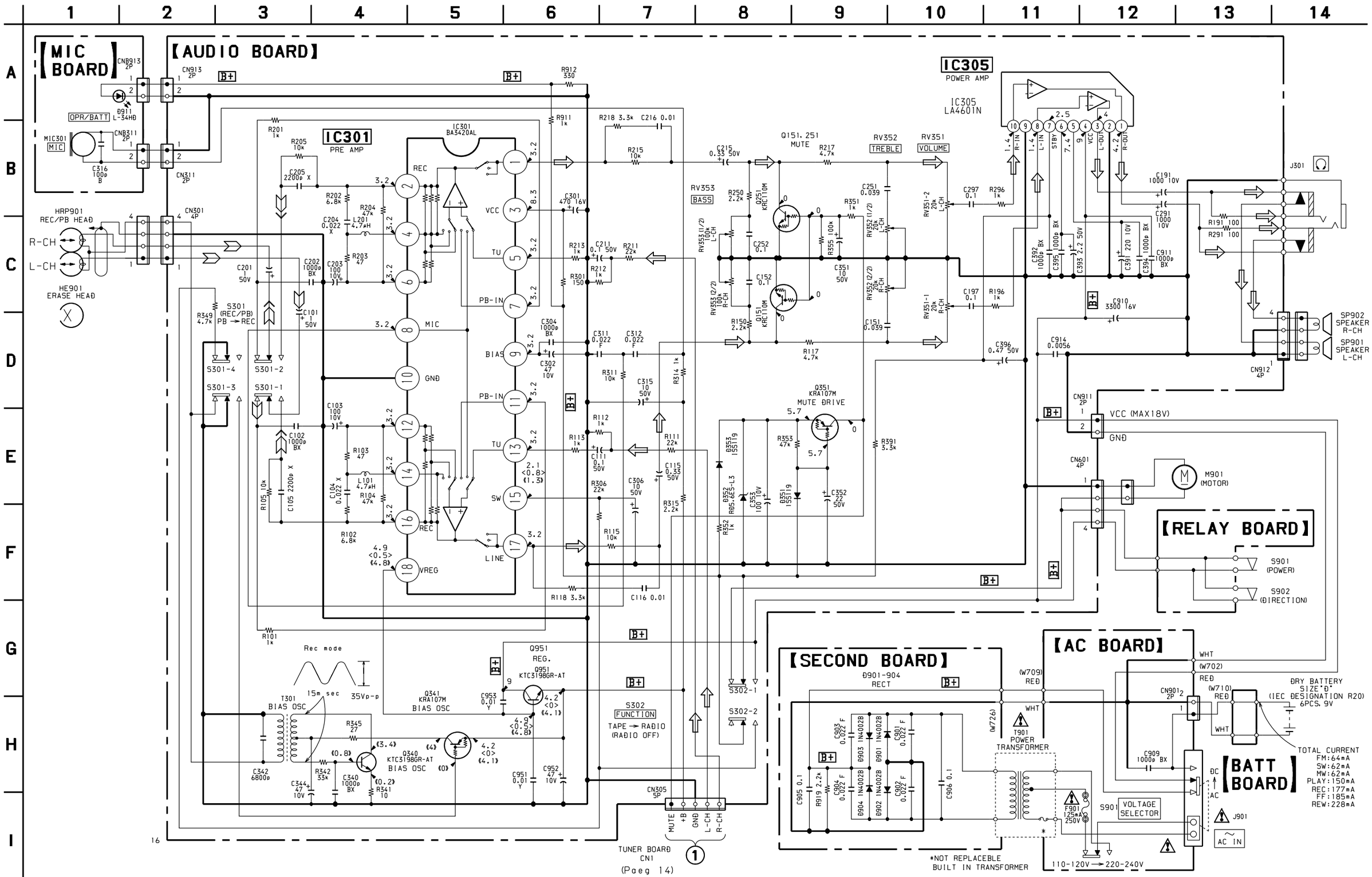
- ○—— : parts extracted from the component side.
- ⬚← : indicates side identified with part number.
- ▒▒ : Pattern from the side which enables seeing.

5-3. SCHEMATIC DIAGRAM – TUNER SECTION –

• Refer to page 11 for IC BLOCK DIAGRAM.



5-4. SCHEMATIC DIAGRAM – AUDIO SECTION –



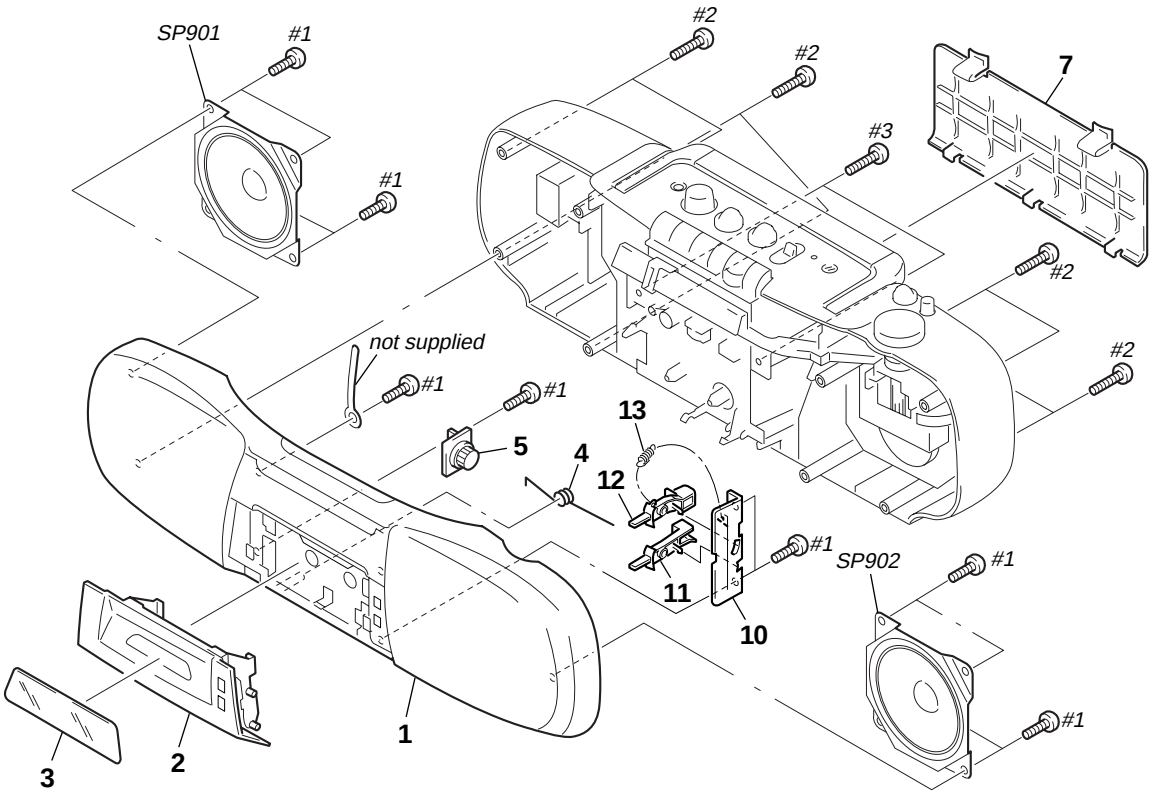
SECTION 6
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbrevation
  EA : Saudi Arabia
  SP : Singapore
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appear anceP arts
  Example :
  KNOB, BALANCE (WHITE).....(RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

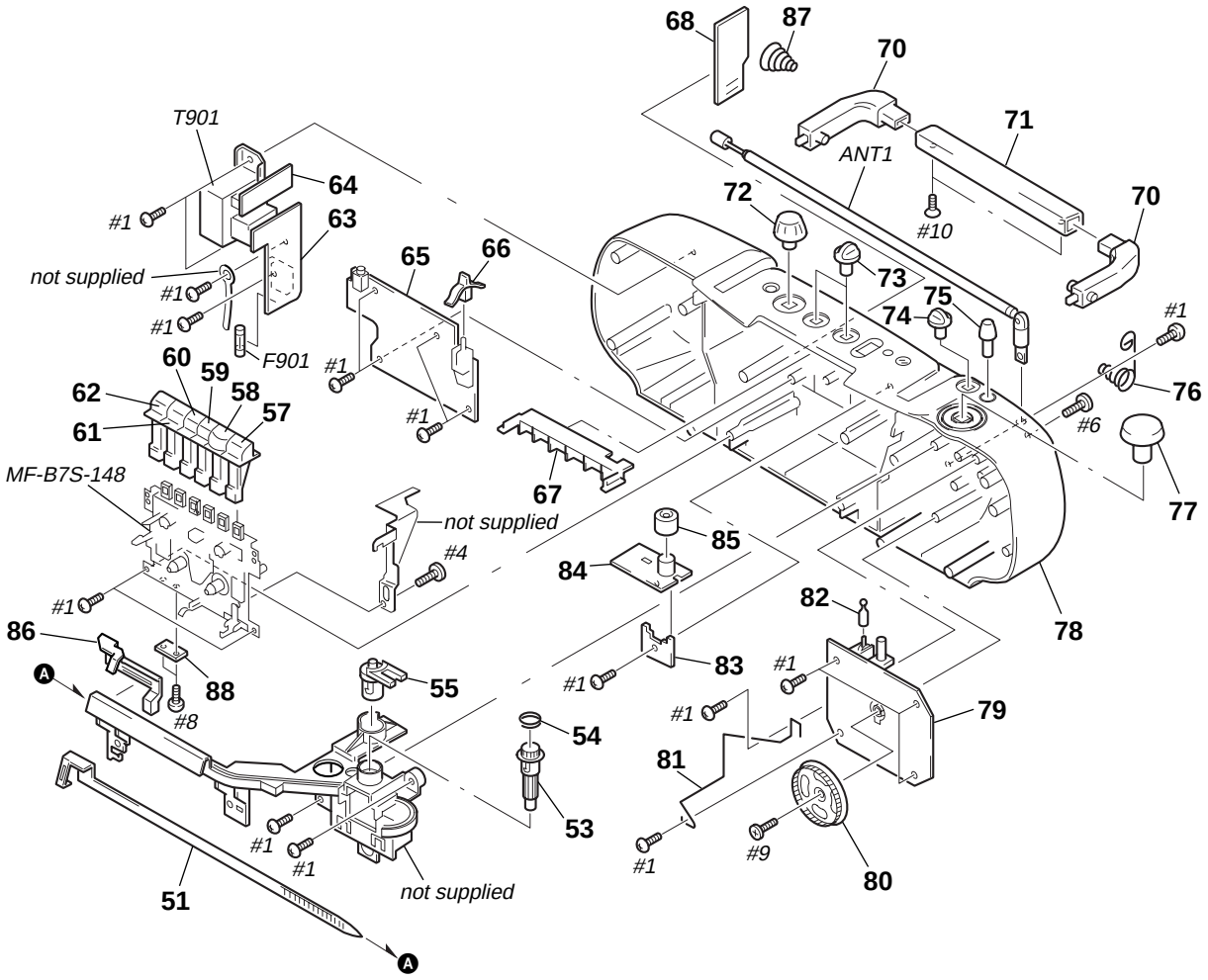
6-1. FRONT CABINET SECTION



Ref. No.	Part No.	Description	Remarks
1	X-3376-542-1	CABINET (FRONT) SUB ASSY (BLACK) (EA)	
1	X-3376-543-1	CABINET (FRONT) SUB ASSY (RED) (EA)	
1	X-3376-544-1	CABINET (FRONT) SUB ASSY (BLACK) (E,SP)	
1	X-3376-545-1	CABINET (FRONT) SUB ASSY (RED) (E,SP)	
2	3-029-934-01	LID,CASSETTE (BLACK)	
2	3-029-934-11	LID,CASSETTE (RED)	
3	3-031-224-01	WINDOW, CASSETTE	
4	3-025-555-01	SPRING (CASSETTE)	
5	3-922-112-11	DAMPER	
7	3-917-646-01	LID,BATTERY CASE (BLACK)	

Ref. No.	Part No.	Description	Remarks
7	3-917-646-11	LID,BATTERY CASE (RED)	
10	3-029-974-01	CHASSIS (DIR)	
11	3-029-973-01	LEVER (MODE) (BLACK)	
11	3-029-973-11	LEVER (MODE) (RED)	
12	3-029-972-01	LEVER (DIR) (BLACK)	
12	3-029-972-11	LEVER (DIR) (RED)	
13	3-031-256-01	SPRING (DIR)	
SP901	1-505-955-11	SPEAKER (10cm)	
SP902	1-505-955-11	SPEAKER (10cm)	

6-2. REAR CABINET SECTION

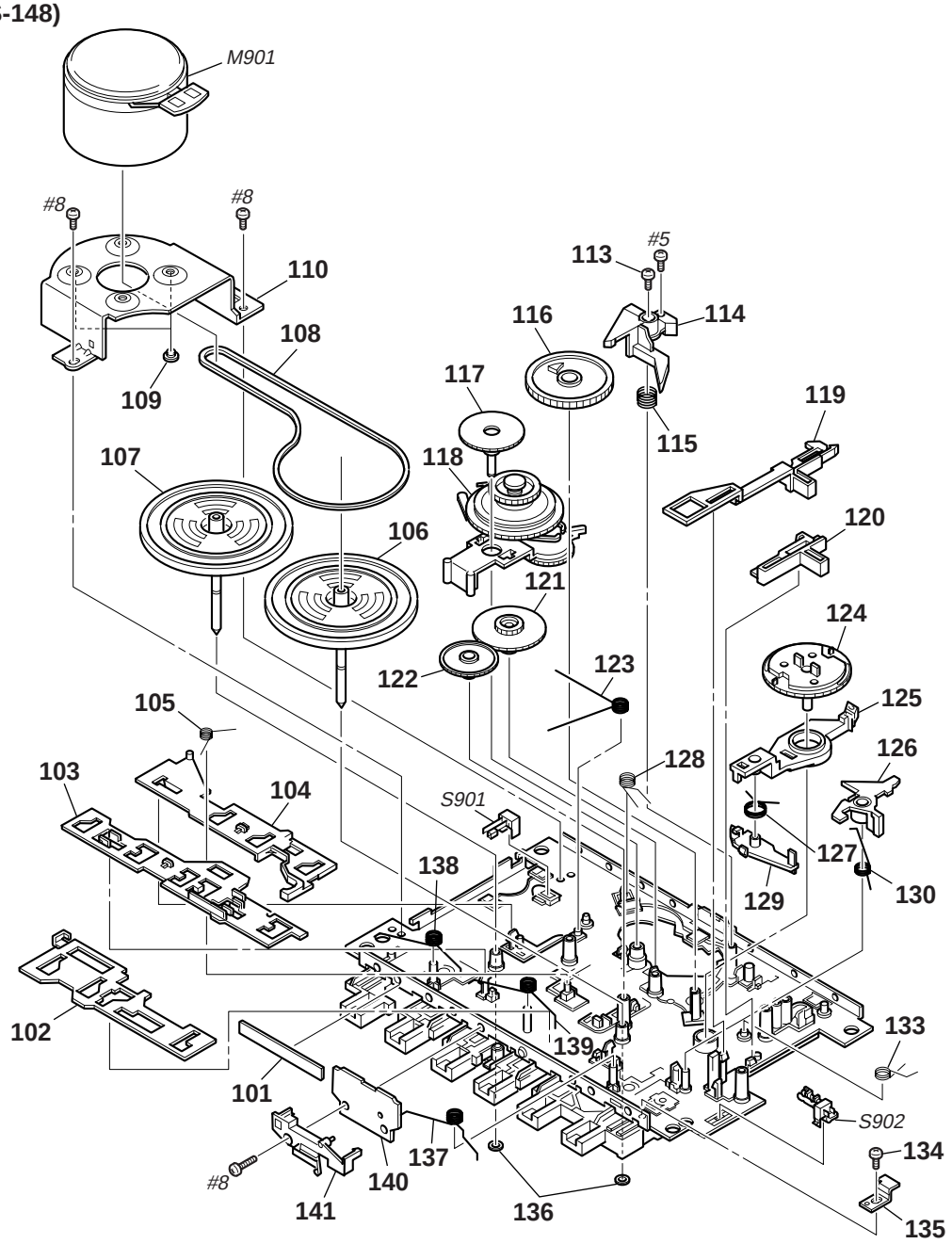


Ref. No.	Part No.	Description	Remarks
51	3-025-530-01	POINTER	
53	3-025-545-01	SHAFT (TUNE)	
54	3-025-560-01	SPRING (TU)	
55	3-025-546-01	SHAFT (FUNCTION)	
57	3-025-534-01	BUTTON (REC)	
58	3-025-537-01	BUTTON (PLAY)	
59	3-025-536-11	BUTTON (REW)	
60	3-025-535-11	BUTTON (FF)	
61	3-025-538-01	BUTTON (STOP)	
62	3-025-533-01	BUTTON (PAUSE)	
* 63	1-670-178-11	AC BOARD	
* 64	1-670-173-11	SECOND BOARD	
* 65	A-3321-464-A	AUDIO BOARD	
66	3-025-541-01	LEVER (FUNCTION) (BLACK)	
66	3-025-541-11	LEVER (FUNCTION) (RED)	
67	3-025-550-01	CHASSIS (MD)	
* 68	1-670-172-11	BATT BOARD	
70	3-025-548-01	HANDLE (SIDE)	
71	3-025-549-01	HANDLE (C) (BLACK)	
71	3-025-549-11	HANDLE (C) (RED)	
72	3-025-539-21	KNOB(VOLUME)	
73	3-025-540-21	KNOB(HYPER TREBLE/MEGA BASS)	
74	3-025-542-01	KNOB(BAND) (BLACK)	

Ref. No.	Part No.	Description	Remarks
74	3-025-542-11	KNOB(BAND) (RED)	
75	3-025-544-01	KNOB(FINE TUNE) (BLACK)	
75	3-025-544-11	KNOB(FINE TUNE) (RED)	
76	3-029-701-01	SPRING (+-), TERMINAL COIL	
77	3-025-543-01	KNOB(TUNE) (BLACK)	
77	3-025-543-11	KNOB(TUNE) (RED)	
78	3-025-528-61	CABINET (REAR) (BLACK)	
78	3-025-528-71	CABINET (REAR) (RED)	
* 79	A-3321-465-A	TUNER BOARD (E,SP)	
* 79	A-3321-471-A	TUNER BOARD (EA)	
80	3-025-547-01	GEAR(VC)	
81	3-025-559-01	TERMINAL, ANTENNA	
82	3-025-551-01	CAP(FUNCTION)	
* 83	1-670-179-11	SUPPORT BOARD	
* 84	1-670-174-11	MIC BOARD	
* 85	3-911-281-01	CUSHION, MIC	
86	3-029-997-01	INDICATOR	
87	3-025-557-01	TERMINAL (-), BATTERY	
* 88	1-672-614-11	RELAY BOARD	
ANT1	1-501-918-11	ANTENNA, TELESCOPIC	
⚠F901	1-532-149-31	FUSE,0.125A 250V	
⚠T901	1-431-916-11	TRANSFORMER, POWER	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

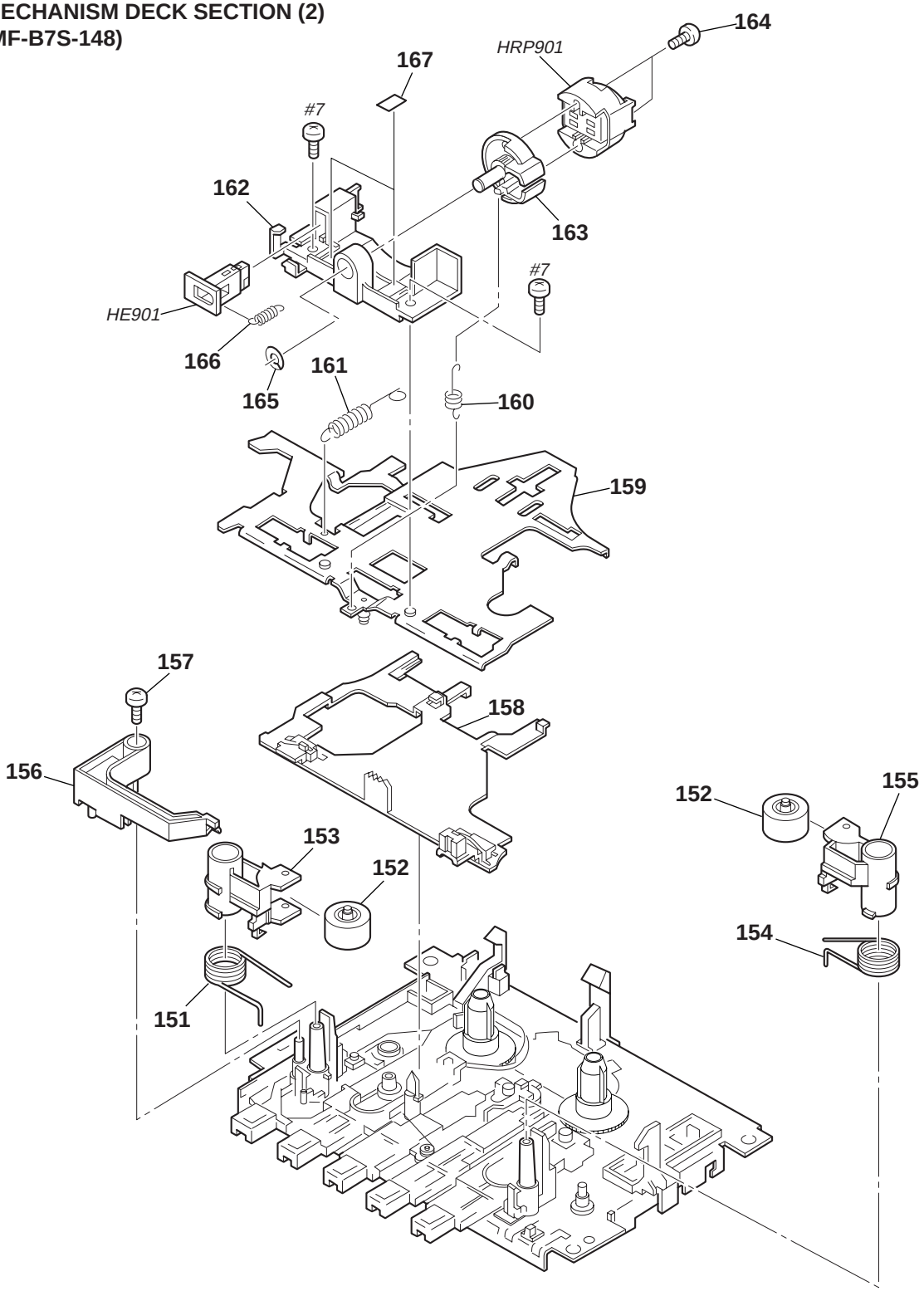
6-3. MECHANISM DECK SECTION (1)
(MF-B7S-148)



Ref. No.	Part No.	Description	Remarks
101	3-034-049-01	SPACER(MD)	
* 102	3-024-566-01	SLIDER (SD)	
103	3-024-556-01	PLATE, LOCK	
* 104	3-024-585-01	SLIDER (PSW)	
105	3-024-990-01	SPRING (LOCK PLATE), TORSION	
106	X-3375-501-1	FLYWHEEL (F) ASSY	
107	X-3376-512-1	FLYWHEEL (S) ASSY	
108	3-024-989-01	BELT	
109	3-343-251-01	SCREW (M2.6 × 2.5)	
* 110	3-024-615-01	BRACKET, MOTOR	
113	3-034-575-01	SCREW+1.7 × 4	
114	3-024-564-01	LEVER (U), SO	
115	3-024-980-01	SPRING, COMPRESSION	
116	3-024-590-01	GEAR, SO	
117	3-024-604-01	GEAR (DRIVING)	
118	X-3375-505-1	LEVER ASSY, IDLER	
* 119	3-024-561-01	SLIDER (MODE)	
* 120	3-024-606-01	SLIDER (MD)	
121	3-024-591-01	GEAR (B), SO	
122	3-024-584-01	GEAR (MID-B)	

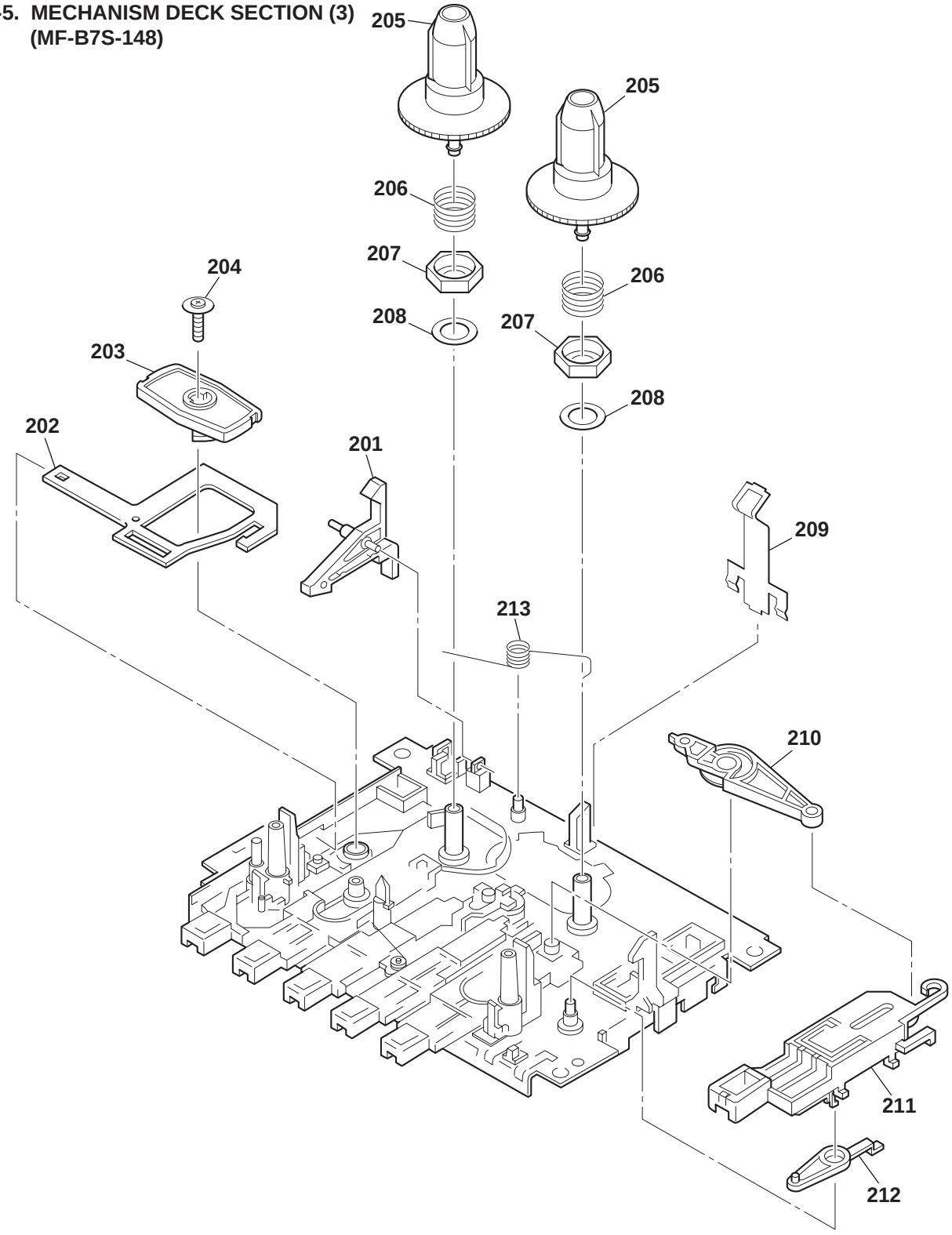
Ref. No.	Part No.	Description	Remarks
123	3-024-977-01	SPRING (EJECT), TORSION	
124	3-024-587-01	GEAR (MANUAL D)	
125	3-024-563-01	LEVER (A), SO	
126	3-024-562-01	LEVER, M LOCK	
127	3-024-976-01	SPRING (SO LEVER B), TORSION	
128	3-024-983-01	SPRING (CNT), TORSION	
129	3-024-607-01	LEVER (B), SO	
130	3-024-974-01	SPRING (M LOCK LEVER), TORSION	
133	3-024-986-01	SPRING (M KNOB), TORSION	
134	3-030-741-01	SCREW (M2 × 2)	
135	3-030-667-01	PLATE, RETAINER	
136	3-343-358-01	RING, RETAINING	
137	3-024-973-01	SPRING (REC), TORSION	
138	3-024-985-01	SPRING (STOP), TORSION	
139	3-024-972-01	SPRING (FR), TORSION	
140	1-670-207-11	TRANSLATION (HEAD) BOARD	
141	3-024-600-01	ARM,PAS (PROTECTOR LEAD)	
M901	A-3320-436-A	MOTOR ASSY	
S901	1-692-302-11	SWITCH, LEAF (DIRECTION)	
S902	1-571-556-11	SWITCH, LEAF (POWER)	

6-4. MECHANISM DECK SECTION (2) (MF-B7S-148)



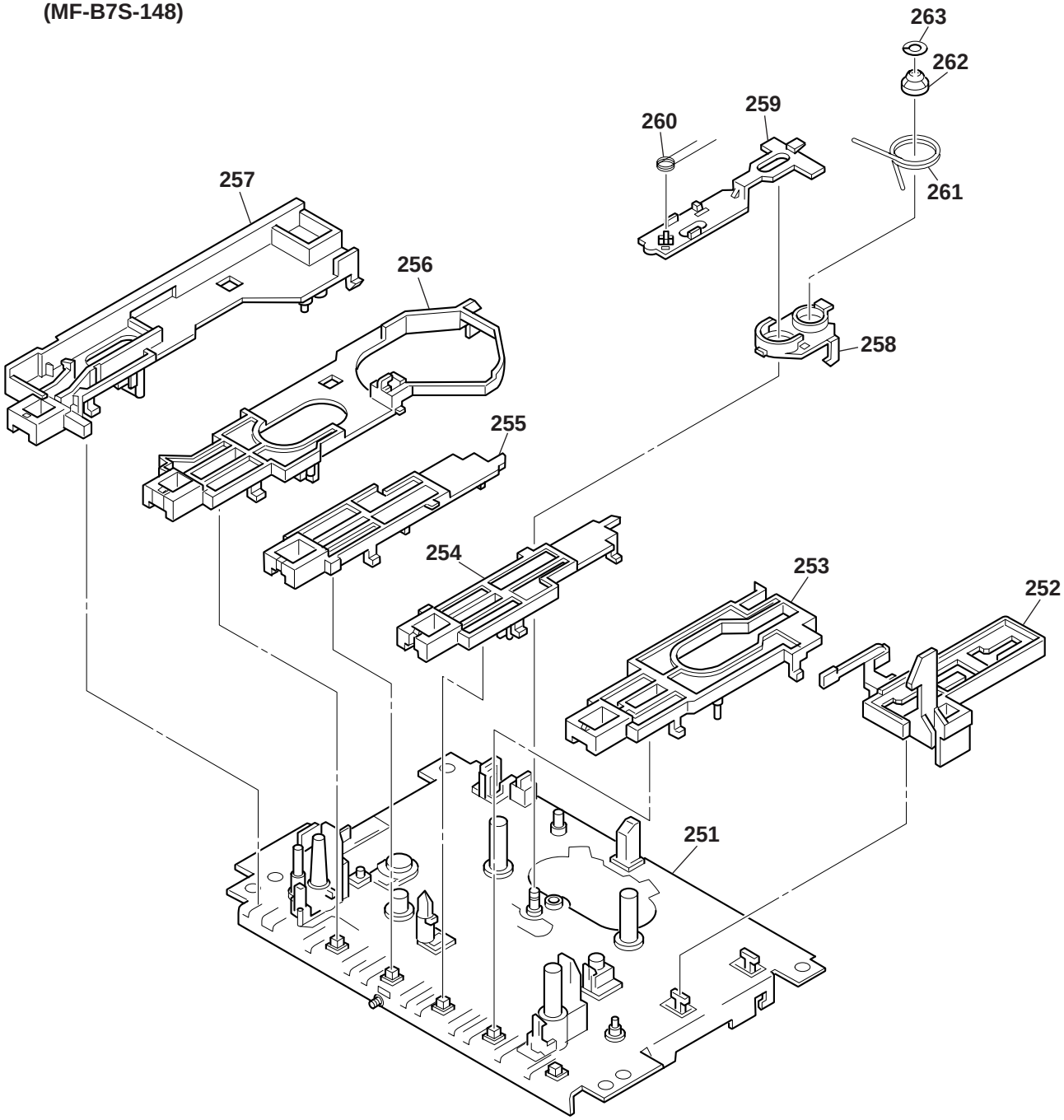
Ref. No.	Part No.	Description	Remarks
151	3-024-979-01	SPRING (PINCH R), TORSION	
152	3-933-024-01	ROLLER, PINCH	
153	3-024-575-01	ARM(R), PINCH	
154	3-024-978-01	SPRING (PINCH N), TORSION	
155	3-024-574-01	ARM(F), PINCH	
156	3-024-596-01	ARM, EBF	
157	3-034-575-01	SCREW	
158	3-024-609-01	SLIDER, D	
159	X-3375-504-1	CHASSIS ASSY, HEAD	
160	3-024-987-01	SPRING, TENSION	
161	3-024-988-01	SPRING, TENSION	
162	X-3375-582-1	TABLE ASSY, HEAD	
163	X-3375-581-1	HOLDER ASSY, HD	
164	3-309-597-91	SCREW (1.4), TAPPING	
165	3-386-150-01	RING (ROLLER), RETAINING	
166	3-313-850-03	SPRING, TENSION	
* 167	3-377-197-21	SHEET (AZ)	
HE901	1-500-338-11	HEAD, MAGNETIC (ERASE)	
HRP901	1-543-872-11	HEAD, MAGNETIC (REC/PB)	

6-5. MECHANISM DECK SECTION (3) (MF-B7S-148)



Ref. No.	Part No.	Description	Remarks
201	3-024-589-01	CLAW, PREVENTION	
* 202	3-024-602-01	SLIDER (B), D	
203	3-024-586-01	CAM, MANUAL (D)	
204	3-344-737-11	SCREW (B1.4 × 6), TAPPING	
205	3-024-603-01	GEAR (REEL)	
206	3-024-981-01	SPRING, COMPRESSION	
207	3-024-583-01	SPRING HOLDER	
208	4-931-795-01	WASHER	
209	3-024-611-01	DETENT, CASSETTE	
210	3-024-600-01	ARM, PAS	
* 211	3-024-580-01	SLIDER (PAUSE)	
212	3-024-608-01	PIN, PAUSE LOCK	
213	3-024-992-01	SPRING (FWD), TORSION	

6-6. MECHANISM DECK SECTION (4)
(MF-B7S-148)



Ref. No.	Part No.	Description	Remarks
251	X-3375-503-1	CHASSIS ASSY, MECHANICAL	
* 252	3-024-558-01	SLIDER (EJECT)	
* 253	3-024-557-01	SLIDER (STOP)	
* 254	3-024-572-01	SLIDER (FF)	
* 255	3-024-559-01	SLIDER (REW)	
* 256	3-024-560-01	SLIDER (FWD)	
* 257	3-024-573-01	SLIDER (REC)	

Ref. No.	Part No.	Description	Remarks
258	3-024-588-01	LEVER (FW), ID	
259	3-027-181-01	SLIDER (FR)	
260	3-027-069-01	SPRING (FRW), TORSION	
261	3-024-975-01	SPRING (IDLER LEVER), TORSION	
262	3-024-984-01	SPRING (K), COMPRESSION	
263	3-321-483-11	RING, RETAINING	

SECTION 7
ELECTRICAL PARTS LIST

AC **AUDIO**

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbrevation
  EA : Saudi Arabia
  SP : Singapore
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
*	1-670-178-11	AC BOARD ********			
	1-533-233-31	HOLDER, FUSE			
		< CAPACITOR >			
C909	1-162-294-31	CERAMIC	00001uF	10%	50V
		< CONNECTOR >			
* CN901	1-691-573-11	PIN, CONNECTOR (PC BOARD) 2P			
		< JACK >			
⚠ J901	1-526-838-11	INLET, AC 2P (AC IN)			
		< SWITCH >			
⚠ S901	1-552-921-00	SWITCH, POWER (VOLTAGE CHANGE)(VOLTAGE SELECTOR)			
		< TRANSFORMER >			
⚠ T901	1-431-916-11	TRANSFORMER, POWER			
**********					
*	A-3321-464-A	AUDIO BOARD, COMPLETE **********			
		< CAPACITOR >			
C101	1-124-903-11	ELECT	1uF	20%	50V
C102	1-162-294-31	CERAMIC	0.001uF	10%	50V
C103	1-124-443-00	ELECT	100uF	20%	10V
C104	1-162-843-11	CERAMIC	0.022uF	10%	16V
C105	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C111	1-126-956-91	ELECT	0.1uF	20%	50V
C115	1-124-252-00	ELECT	0.33uF	20%	50V
C116	1-162-306-11	CERAMIC	0.01uF	30%	16V
C151	1-136-160-00	FILM	0.039uF	5%	50V
C152	1-136-165-00	FILM	0.1uF	5%	50V
C191	1-124-473-11	ELECT	1000uF	20%	10V
C197	1-136-165-00	FILM	0.1uF	5%	50V
C201	1-124-903-11	ELECT	1uF	20%	50V
C202	1-162-294-31	CERAMIC	0.001uF	10%	50V
C203	1-124-443-00	ELECT	100uF	20%	10V
C204	1-162-843-11	CERAMIC	0.022uF	10%	16V
C205	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C211	1-126-956-91	ELECT	0.1uF	20%	50V
C215	1-124-252-00	ELECT	0.33uF	20%	50V
C216	1-162-306-11	CERAMIC	0.01uF	30%	16V

Ref. No.	Part No.	Description			Remarks
C251	1-136-160-00	FILM	0.039uF	5%	50V
C252	1-136-165-00	FILM	0.1uF	5%	50V
C291	1-124-473-11	ELECT	1000uF	20%	10V
C297	1-136-165-00	FILM	0.1uF	5%	50V
C301	1-126-941-11	ELECT	470uF	20%	16V
C302	1-104-664-11	ELECT	47uF	20%	10V
C304	1-162-294-31	CERAMIC	0.001uF	10%	50V
C306	1-124-907-11	ELECT	10uF	20%	50V
C311	1-161-494-00	CERAMIC	0.022uF	25V	
C312	1-161-494-00	CERAMIC	0.022uF	25V	
C315	1-124-907-11	ELECT	10uF	20%	50V
C340	1-162-294-31	CERAMIC	0.001uF	10%	50V
C342	1-130-481-00	MYLAR	0.0068uF	5%	50V
C344	1-104-664-11	ELECT	47uF	20%	10V
C351	1-124-907-11	ELECT	10uF	20%	50V
C352	1-126-233-11	ELECT	22uF	20%	50V
C353	1-124-443-00	ELECT	100uF	20%	10V
C391	1-104-666-11	ELECT	220uF	20%	10V
C392	1-162-294-31	CERAMIC	0.001uF	10%	50V
C393	1-126-961-11	ELECT	2.2uF	20%	50V
C394	1-162-294-31	CERAMIC	0.001uF	10%	50V
C395	1-162-294-31	CERAMIC	0.001uF	10%	50V
C396	1-124-902-00	ELECT	0.47uF	20%	50V
C910	1-126-944-11	ELECT	3300uF	20%	16V
C911	1-162-294-31	CERAMIC	0.001uF	10%	50V
C914	1-136-683-11	FILM	0.0056uF	5%	100V
C951	1-162-306-11	CERAMIC	0.01uF	30%	16V
C952	1-104-664-11	ELECT	47uF	20%	10V
C953	1-162-306-11	CERAMIC	0.01uF	30%	16V
		< CABLE HOLDER >			
* CH913	1-573-287-11	HOLDER, CABLE 2P			
		< CONNECTOR >			
CN301	1-506-986-11	PIN, CONNECTOR (PC BOARD) 4P			
* CN305	1-568-271-11	SOCKET, CONNECTOR 5P			
CN601	1-506-986-11	PIN, CONNECTOR (PC BOARD) 4P			
* CN911	1-691-573-11	PIN, CONNECTOR (PC BOARD) 2P			
CN912	1-506-986-11	PIN, CONNECTOR (PC BOARD) 4P			
		< DIODE >			
D351	8-719-991-34	DIODE 1SS133T-72			
D352	8-719-123-54	DIODE RD5.6ES-L3			
D353	8-719-991-34	DIODE 1SS133T-72			
		< IC >			
IC301	8-759-978-54	IC BA3420AL			
IC305	8-759-543-56	IC LA4601N			

Ref. No.	Part No.	Description				Remarks
		< JACK >				
J301	1-566-891-11	JACK (PHONES)				
		< COIL >				
L101	1-410-324-11	INDUCTOR	4.7uH			
L201	1-410-324-11	INDUCTOR	4.7uH			
		< TRANSISTOR >				
Q151	8-729-036-80	TRANSISTOR KRC110M				
Q251	8-729-036-80	TRANSISTOR KRC110M				
Q340	8-729-036-89	TRANSISTOR KTC3198GR-AT				
Q341	8-729-037-34	TRANSISTOR KRA107M				
Q351	8-729-037-34	TRANSISTOR KRA107M				
Q951	8-729-036-89	TRANSISTOR KTC3198GR-AT				
		< RESISTOR >				
R101	1-249-417-11	CARBON	1K	5%	1/4W	F
R102	1-249-427-11	CARBON	6.8K	5%	1/4W	F
R103	1-249-401-11	CARBON	47	5%	1/4W	F
R104	1-249-437-11	CARBON	47K	5%	1/4W	
R105	1-249-429-11	CARBON	10K	5%	1/4W	
R111	1-249-433-11	CARBON	22K	5%	1/4W	
R112	1-249-417-11	CARBON	1K	5%	1/4W	F
R113	1-249-417-11	CARBON	1K	5%	1/4W	F
R115	1-249-429-11	CARBON	10K	5%	1/4W	
R117	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R118	1-247-843-11	CARBON	3.3K	5%	1/4W	
R150	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R191	1-247-807-31	CARBON	100	5%	1/4W	
R196	1-249-417-11	CARBON	1K	5%	1/4W	F
R201	1-249-417-11	CARBON	1K	5%	1/4W	F
R202	1-249-427-11	CARBON	6.8K	5%	1/4W	F
R203	1-249-401-11	CARBON	47	5%	1/4W	F
R204	1-249-437-11	CARBON	47K	5%	1/4W	
R205	1-249-429-11	CARBON	10K	5%	1/4W	
R211	1-249-433-11	CARBON	22K	5%	1/4W	
R212	1-249-417-11	CARBON	1K	5%	1/4W	F
R213	1-249-417-11	CARBON	1K	5%	1/4W	F
R215	1-249-429-11	CARBON	10K	5%	1/4W	
R217	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R218	1-247-843-11	CARBON	3.3K	5%	1/4W	
R250	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R291	1-247-807-31	CARBON	100	5%	1/4W	
R296	1-249-417-11	CARBON	1K	5%	1/4W	F
R301	1-249-407-11	CARBON	150	5%	1/4W	F
R306	1-249-433-11	CARBON	22K	5%	1/4W	
R311	1-249-429-11	CARBON	10K	5%	1/4W	
R314	1-249-417-11	CARBON	1K	5%	1/4W	F
R315	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R341	1-249-393-11	CARBON	10	5%	1/4W	F
R342	1-249-435-11	CARBON	33K	5%	1/4W	
R345	1-249-398-11	CARBON	27	5%	1/4W	F
R349	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R351	1-249-417-11	CARBON	1K	5%	1/4W	F
R352	1-249-417-11	CARBON	1K	5%	1/4W	F
R353	1-249-437-11	CARBON	47K	5%	1/4W	
R355	1-249-441-11	CARBON	100K	5%	1/4W	
R391	1-247-843-11	CARBON	3.3K	5%	1/4W	
R911	1-249-417-11	CARBON	1K	5%	1/4W	F
R912	1-249-411-11	CARBON	330	5%	1/4W	

Ref. No.	Part No.	Description				Remarks
		< VARIABLE RESISTOR >				
RV351	1-225-638-11	RES, VAR, CARBON 20K/20K (VOLUME)				
RV352	1-225-639-11	RES, VAR, CARBON 20K/20K (HYPER TREBLE)				
RV353	1-225-640-11	RES, VAR, CARBON 100K/100K (MEGA BASS)				
		< SWITCH >				
S301	1-571-472-11	SWITCH, SLIDE (REC/PB)				
S302	1-570-729-11	SWITCH, LEVER SLIDE (FUNCTION)				
		< TRANSFORMER >				
T301	1-433-268-00	TRANSFORMER, BIAS OSCILLATOR				
**********						
*	1-670-172-11	BATT BOARD				
		**********				
	3-025-557-01	TERMINAL (-), BATTERY				
**********						
*	1-670-174-11	MIC BOARD				
		**********				
		< CAPACITOR >				
C316	1-162-282-31	CERAMIC	100PF	10%	50V	
		< LED >				
D911	8-719-059-97	LED L-34HD (OPR/BATT)				
		< MICROPHONE >				
MIC301	1-542-118-11	MICROPHONE, ELECTRET CONDENSER (MIC)				
**********						
*	1-672-614-11	RELAY BOARD				
		**********				
**********						
*	1-670-173-11	SECOND BOARD				
		**********				
		< CAPACITOR >				
C901	1-101-005-00	CERAMIC	22000PF	50V		
C902	1-101-005-00	CERAMIC	22000PF	50V		
C903	1-101-005-00	CERAMIC	22000PF	50V		
C904	1-101-005-00	CERAMIC	22000PF	50V		
C905	1-136-165-00	FILM	0.1uF	5%	50V	
C906	1-136-165-00	FILM	0.1uF	5%	50V	
		< DIODE >				
D901	8-719-063-79	DIODE 1N4002B				
D902	8-719-063-79	DIODE 1N4002B				
D903	8-719-063-79	DIODE 1N4002B				
D904	8-719-063-79	DIODE 1N4002B				
		< RESISTOR >				
R919	1-249-421-11	CARBON	2.2K	5%	1/4W	F
**********						
*	1-670-179-11	SUPPORT BOARD				
		**********				
**********						

Ref. No.	Part No.	Description			Remarks
	1-670-207-11	TRANSLATION (HEAD) BOARD			
		**********			
**********					
*	A-3321-465-A	TUNERBOARD, COMPLETE (E,SP)			
*	A-3321-471-A	TUNERBOARD, COMPLETE (EA)			
		**********			
		< CAPACITOR >			
C1	1-162-286-31	CERAMIC	220PF	10%	50V
C2	1-162-215-31	CERAMIC	47PF	5%	50V
C3	1-162-306-11	CERAMIC	0.01uF	30%	16V
C4	1-104-664-11	ELECT	47uF	20%	10V
C5	1-162-294-31	CERAMIC	0.001uF	10%	50V
C6	1-162-204-31	CERAMIC	16PF	5%	50V (E,SP)
C6	1-162-207-31	CERAMIC	22PF	5%	50V (EA)
C8	1-102-959-00	CERAMIC	22PF	5%	50V (E,SP)
C8	1-102-961-00	CERAMIC	27PF	5%	50V (EA)
C10	1-162-193-31	CERAMIC	3.3PF	10%	50V
C11	1-162-306-11	CERAMIC	0.01uF	30%	16V
C14	1-162-282-31	CERAMIC	100PF	10%	50V
C15	1-126-963-11	ELECT	4.7uF	20%	50V
C16	1-124-903-11	ELECT	1uF	20%	50V
C17	1-124-907-11	ELECT	10uF	20%	50V
C18	1-124-907-11	ELECT	10uF	20%	50V
C19	1-162-306-11	CERAMIC	0.01uF	30%	16V
C20	1-124-903-11	ELECT	1uF	20%	50V
C21	1-126-961-11	ELECT	2.2uF	20%	50V
C22	1-124-443-00	ELECT	100uF	20%	10V
C23	1-124-902-00	ELECT	0.47uF	20%	50V
C24	1-126-963-11	ELECT	4.7uF	20%	50V
C25	1-126-956-91	ELECT	0.1uF	20%	50V
C26	1-162-203-31	CERAMIC	15PF	5%	50V
C27	1-161-050-00	CERAMIC	0.0082uF	10%	16V
C28	1-161-050-00	CERAMIC	0.0082uF	10%	16V
C29	1-162-282-31	CERAMIC	100PF	10%	50V
C30	1-162-282-31	CERAMIC	100PF	10%	50V
C32	1-162-198-31	CERAMIC	8.2PF	10%	50V
C35	1-162-282-31	CERAMIC	100PF	10%	50V
C36	1-164-617-11	CERAMIC	4PF	5%	50V
C38	1-162-203-31	CERAMIC	15PF	5%	50V (E,SP)
C38	1-162-205-31	CERAMIC	18PF	5%	50V (EA)
C39	1-164-617-11	CERAMIC	4PF	5%	50V
C40	1-136-480-11	FILM	0.0015uF	5%	100V
C41	1-107-734-11	FILM	360PF	5%	100V
C42	1-136-683-11	FILM	0.0056uF	5%	100V
C46	1-162-282-31	CERAMIC	100PF	10%	50V
C47	1-162-282-31	CERAMIC	100PF	10%	50V
C50	1-162-282-31	CERAMIC	100PF	10%	50V
C51	1-162-294-31	CERAMIC	0.001uF	10%	50V
C52	1-162-202-31	CERAMIC	13PF	5%	50V
C53	1-162-287-31	CERAMIC	270PF	10%	50V
C71	1-162-306-11	CERAMIC	0.01uF	30%	16V
		< FILTER >			
CF1	1-760-738-61	FILTER, CERAMIC			
CF2	1-567-670-11	FILTER, CERAMIC			

Ref. No.	Part No.	Description				Remarks
		< CONNECTOR >				
CN1	1-506-987-11	PIN, CONNECTOR (PC BOARD) 5P				
		< TRIMMER >				
CT6	1-141-485-11	CAP, ADJ 5PF				
CT8	1-141-485-11	CAP, ADJ 5PF				
		< VARIABLE CAPACITOR >				
CT1-4	1-151-693-1	CAP, VAR (TUNE)				
CV1-4	1-151-693-1	CAP, VAR (TUNE)				
		< DIODE >				
D1	8-719-911-19	DIODE 1SS119				
D2	8-719-911-19	DIODE 1SS119				
D3	8-719-911-19	DIODE 1SS119				
		< IC >				
IC1	8-752-050-20	IC CXA1238S				
		< COIL >				
L1	1-406-998-11	COIL, AIR-CORE (E,SP)				
L1	1-406-999-11	COIL, AIR-CORE (EA)				
L2	1-422-230-11	COIL, AIR-CORE (E,SP)				
L2	1-406-957-21	COIL(WITH CORE) (EA)				
L3	1-754-000-21	ANTENNA, FERRITE-ROD (MW)				
L4	1-406-470-11	COIL(OSC)				
L5	1-402-597-31	COIL(ANT)				
L6	1-406-247-11	COIL(OSC)				
L7	1-402-595-31	COIL(ANT)				
L8	1-406-253-11	COIL(OSC)				
L9	1-410-750-41	INDUCTOR	0.47uH			
L12	1-410-750-41	INDUCTOR	0.47uH			
		< TRANSISTOR >				
Q1	8-729-036-77	TRANSISTOR KRC107M				
Q2	8-729-036-89	TRANSISTOR KTC3198GR-AT				
		< RESISTOR >				
R1	1-249-429-11	CARBON	10K	5%	1/4W	
R3	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R6	1-249-441-11	CARBON	100K	5%	1/4W	
R9	1-249-441-11	CARBON	100K	5%	1/4W	
R10	1-249-397-11	CARBON	22	5%	1/4W	F
R11	1-249-427-11	CARBON	6.8K	5%	1/4W	F
R12	1-249-427-11	CARBON	6.8K	5%	1/4W	F
R14	1-249-429-11	CARBON	10K	5%	1/4W	
R15	1-247-887-00	CARBON	220K	5%	1/4W	
R16	1-247-887-00	CARBON	220K	5%	1/4W	
R17	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R21	1-249-409-11	CARBON	220	5%	1/4W	F
R30	1-249-417-11	CARBON	1K	5%	1/4W	F
R31	1-247-854-11	CARBON	9.1K	5%	1/4W	
R32	1-249-441-11	CARBON	100K	5%	1/4W	
R33	1-249-415-11	CARBON	680	5%	1/4W	F

TUNER

Ref. No.	Part No.	Description	Remarks
		< VARIABLE RESISTOR >	
RV1	1-228-995-00	RES, ADJ, METAL22K	
RV2	1-225-637-11	RES, VAR, CARBON 100 (FINE TUNE)	
		< SWITCH >	
S1	1-571-147-11	SWITCH, LEVER SLIDE (BAND)	
		< TRANSFORMER >	
T1	1-409-944-11	COIL(DET)	
T2	1-406-952-11	TRANSFORMER, IF	
**********			
		MISCELLANEOUS	
		**********	
ANT1	1-501-918-11	ANTENNA, TELESCOPIC	
⚠F901	1-532-149-31	FUSE,0.125A 250V	
HE901	1-500-338-11	HEAD, MAGNETIC (ERASE)	
HRP901	1-543-872-11	HEAD, MAGNETIC (REC/PB)	
S901	1-692-302-11	SWITCH, LEAF (POWER)	
S902	1-571-556-11	SWITCH, LEAF (DIRECTION)	
SP901	1-505-955-11	SPEAKER (10cm)	
SP902	1-505-955-11	SPEAKER (10cm)	
⚠T901	1-431-916-11	TRANSFORMER, POWER	
**********			

Ref. No.	Part No.	Description	Remarks
		ACCESSORIES & PACKING MATERIALS	
		**********	
⚠	1-569-008-21	ADAPTOR, CONVERSION (2P) (EA)	
⚠	1-769-412-13	CORD,POWER	
	3-865-191-11	MANUAL, INSTRUCTION (ENGLISH)	
	3-865-191-21	MANUAL, INSTRUCTION (FRENCH/SPANISH)	(E,SP)
	3-865-191-41	MANUAL, INSTRUCTION (ARABIC)(EA)	
**********			
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-647-79	SCREW +BVTP 3 × 10 TYPE2 N-S	
#2	7-685-648-79	SCREW +BVTP 3 × 12 TYPE2 N-S	
#3	7-685-650-79	SCREW +BVTP 3 × 16 TYPE2 N-S	
#4	7-685-533-14	SCREW +BTP 2.6 × 6 TYPE2 N-S	
#5	7-685-532-19	SCREW +BTP 2.6 × 5 TYPE2 N-S	
#6	7-682-548-09	SCREW +B 3 × 8	
#7	7-621-772-10	SCREW +B 2 × 4	
#8	7-685-851-04	SCREW +BVTT 2 × 4	
#9	7-621-770-67	SCREW +B 2.6 × 6	
#10	7-685-248-19	SCREW +KTP 3 × 12 TYPE2 NON-SLIT	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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